

WE CLAIM:

1. A method in a user equipment (501) for uplink timing alignment, the user equipment being comprised in wireless communications network, the method comprising:
 - initiating (10) a timing advance value to zero during a creation of a timing advance group, during a modification of a timing advance group, and/or if a timing advance command medium access control control element, TAC MAC CE, is received and a random access procedure has not been performed;
 - receiving (12), from a base station (401), a TAC MAC CE command;
 - updating (16) the timing advance value based on the received TAC MAC CE command; and
 - transmitting (26), to an uplink receiver, uplink communications based on the updated timing advance value.
2. The method of claim 1, wherein the receiving (12) further comprises starting (14) a timing advance timer.
3. The method of any of claims 1-2, wherein the TAC MAC CE command further comprises instructions for updating the timing advance value.
4. The method of any of claims 1-3, wherein the updating (16) further comprises retrieving (15) a mapping timing advance value based on a mapping index, and updating said timing advance value based on the retrieved mapping timing advance value.
5. The method of any of claims 1-4, wherein the updating (16) further comprises maintaining (20) a timing advance value of zero.
6. The method of any of claims 1-5, wherein the updating (16) further comprises ignoring (22) the TAC MAC CE command and maintain the timing advance value of zero.
7. The method of claim 6, further comprising determining (24) a proximity to the uplink receiver is within a threshold value, and/or an uplink cell size is within a threshold value.
8. The method of claim 7, wherein the determining (24) is based on preconfigured rules.

9. The method of claim 5, wherein the TAC MAC CE command does not comprise a timing advance value or timing advance adjustment.
10. The method of any of claims 1-9, further comprising sending (28), to the base station, position information.
11. The method of claim 10, wherein the position information comprises a proximity to the uplink receiver and/or an uplink cell size.
12. A user equipment (501) for uplink timing alignment, the user equipment being comprised in a wireless communications network, the user equipment comprising:
 - processing circuitry (520) configured to initiate a timing advance value to zero during a creation of a timing advance group, during a modification of a timing advance group, and/or if a timing advance command medium access control control element, TAC MAC CE, is received and a random access procedure has not been performed;
 - radio circuitry (510) configured to receive, from a base station (401), a TAC MAC CE command;
 - the processing circuitry (520) further configured to update the timing advance value based on the received TAC MAC CE command; and
 - the radio circuitry (510) further configured to transmit, to an uplink receiver, uplink communications based on the updated timing advance value.
13. The user equipment (501) of claim 12, wherein the processing circuitry (520) is further configured to start a timing advance timer upon receiving the TAC MAC CE.
14. The user equipment (501) of any of claims 12-13, wherein the TAC MAC CE command further comprises instructions for updating the timing advance value.
15. The user equipment (501) of any of claims 12-14, wherein the processing circuitry (520) is further configured to retrieve a mapping timing advance value based on a mapping index, and update said timing advance value based on the retrieved mapping timing advance value.

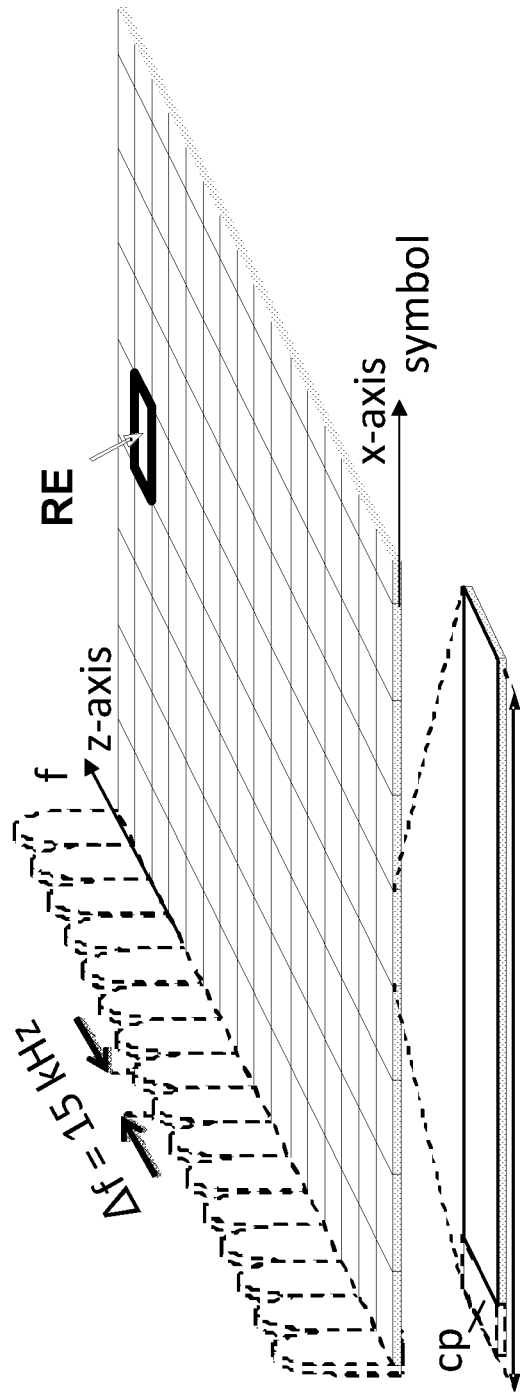
16. The user equipment (501) of any of claims 12-15, wherein the processing circuitry (520) is further configured to maintain a timing advance value of zero.
17. The user equipment (501) of any of claims 12-16, wherein the processing circuitry (520) is further configured to ignore the TAC MAC CE command and maintain the timing advance value of zero.
18. The user equipment (501) of claim 17, wherein the processing circuitry (520) is further configured to determine a proximity to the uplink receiver is within a threshold value, and/or an uplink cell size is within a threshold value.
19. The user equipment (501) of claim 18, wherein the processing circuitry (520) is further configured to determine the proximity and/or uplink cell size based on preconfigured rules.
20. The user equipment (501) of claim 16 wherein the TAC MAC CE command does not comprise a timing advance value or timing advance adjustment.
21. The user equipment (501) of any of claims 12-20, wherein the radio circuitry (510) is further configured to send, to the base station, position information.
22. The user equipment (501) of claim 19, wherein the position information comprises a proximity to the uplink receiver and/or an uplink cell size.
23. A method in a base station (401) for uplink timing alignment, the base station being comprised in a carrier aggregated wireless communications network, the method comprising:
 - estimating (30), for a serving cell, a proximity of a user equipment to an uplink receiver, or a uplink cell size of a user equipment (501), without performing a random access procedure;
 - determining (34) a timing advance command medium access control control element, TAC MAC CE, command based on the estimating (30); and
 - sending (44) the TAC MAC CE command to the user equipment (501) for uplink timing alignment.

24. The method of claim 23, wherein the estimating (30) further comprises estimating (32) that the proximity of the user equipment to the uplink receiver is within a threshold value and/or the uplink cell size of the user equipment is within a threshold value.
25. The method of claim 24, wherein the determining (34) further comprises determining (36) the TAC MAC CE command to have a timing advance value of zero.
26. The method of claim 24, wherein the determining (34) further comprises determining (38) the TAC MAC CE command not to comprise a timing advance value.
27. The method of claim 24, wherein the determining (34) further comprises determining (40) the TAC MAC CE command to comprise instructions for ignoring timing advance values comprised in future TAC MAC CE commands.
28. The method of claim 23, wherein the determining (34) further comprises determining (42) a mapping index to be used for obtaining a timing advance value, and sending said mapping index to the user equipment.
29. A base station (401) for uplink timing alignment, the base station being comprised in a carrier aggregated wireless communications network, the base station comprising:
 - processing circuitry (420) configured to estimate, for a serving cell, a proximity of a user equipment to an uplink receiver, or a uplink cell size of the user equipment (501), without performing a random access procedure;
 - the processing circuitry (420) further configured to determine a timing advance command medium access control control element, TAC MAC CE, command based on the estimation; and
 - radio circuitry (410) configured to send the TAC MAC CE command to the user equipment (501) for uplink timing alignment.
30. The base station (401) of claim 29, wherein the processing circuitry (420) is further configured to estimate that the proximity of the user equipment to the uplink receiver is

within a threshold value and/or the uplink cell size of the user equipment (501) is within a threshold value.

31. The base station (401) of claim 30, wherein the processing circuitry (420) is further configured to determine the TAC MAC CE command to have a timing advance value of zero.
32. The base station (401) of claim 30, wherein the processing circuitry (420) is further configured to determine the TAC MAC CE command not to comprise a timing advance value or timing adjustment.
33. The base station (401) of claim 30, the processing circuitry (420) is further configured to determine the TAC MAC CE command to comprise instructions for ignoring timing advance values comprised in future TAC MAC CE commands.
34. The base station (401) of claim 29, wherein the processing circuitry (420) is further configured to determine a mapping index to be used in obtaining a timing advance value, and the radio circuitry (410) configured to send said mapping index to the user equipment (501).

Dated this the 16th day of July 2014



One OFDM symbol including cp

FIGURE 1

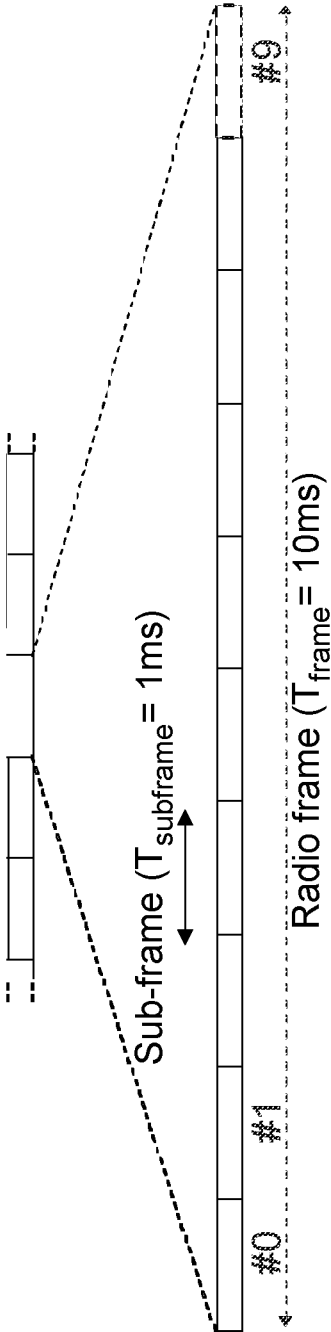


FIGURE 2

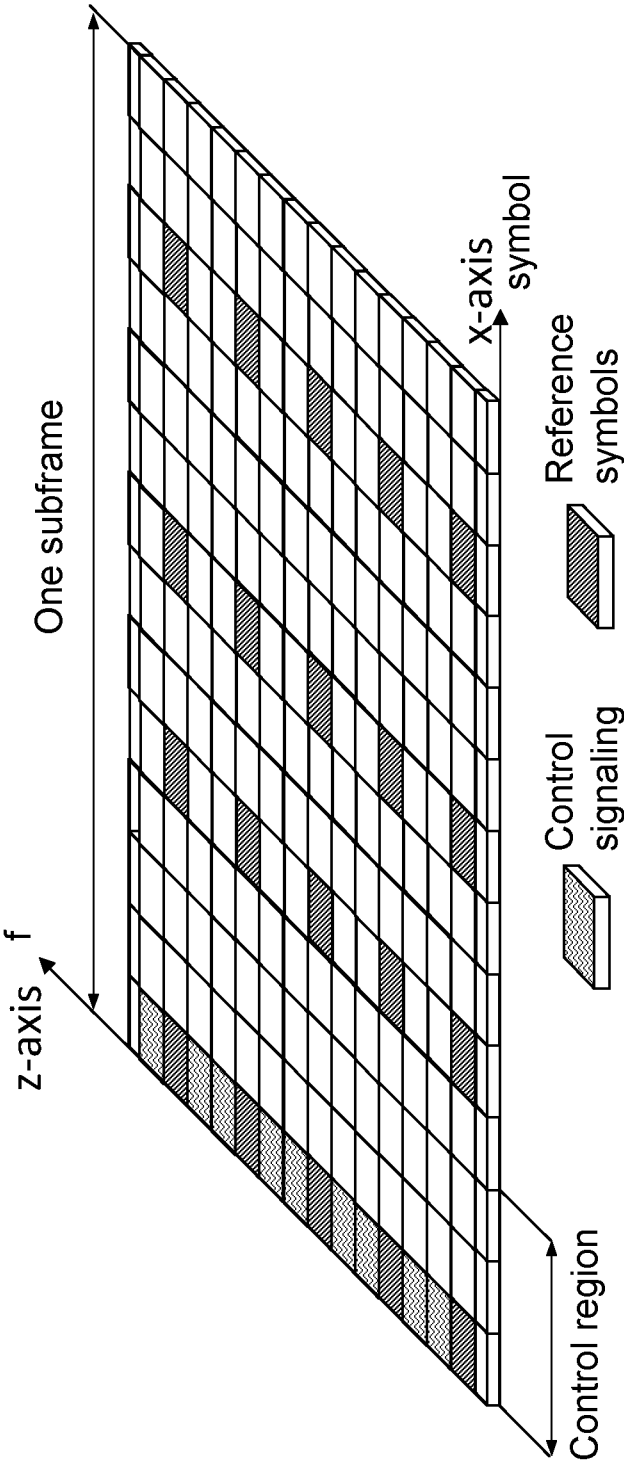


FIGURE 3

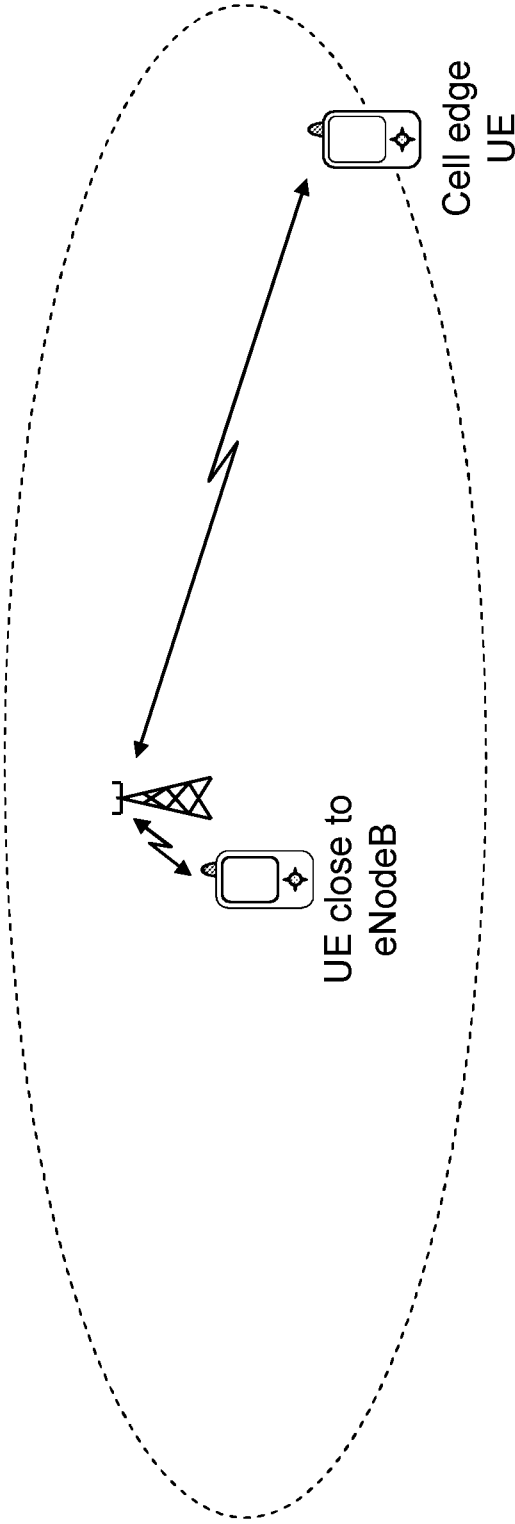


FIGURE 4

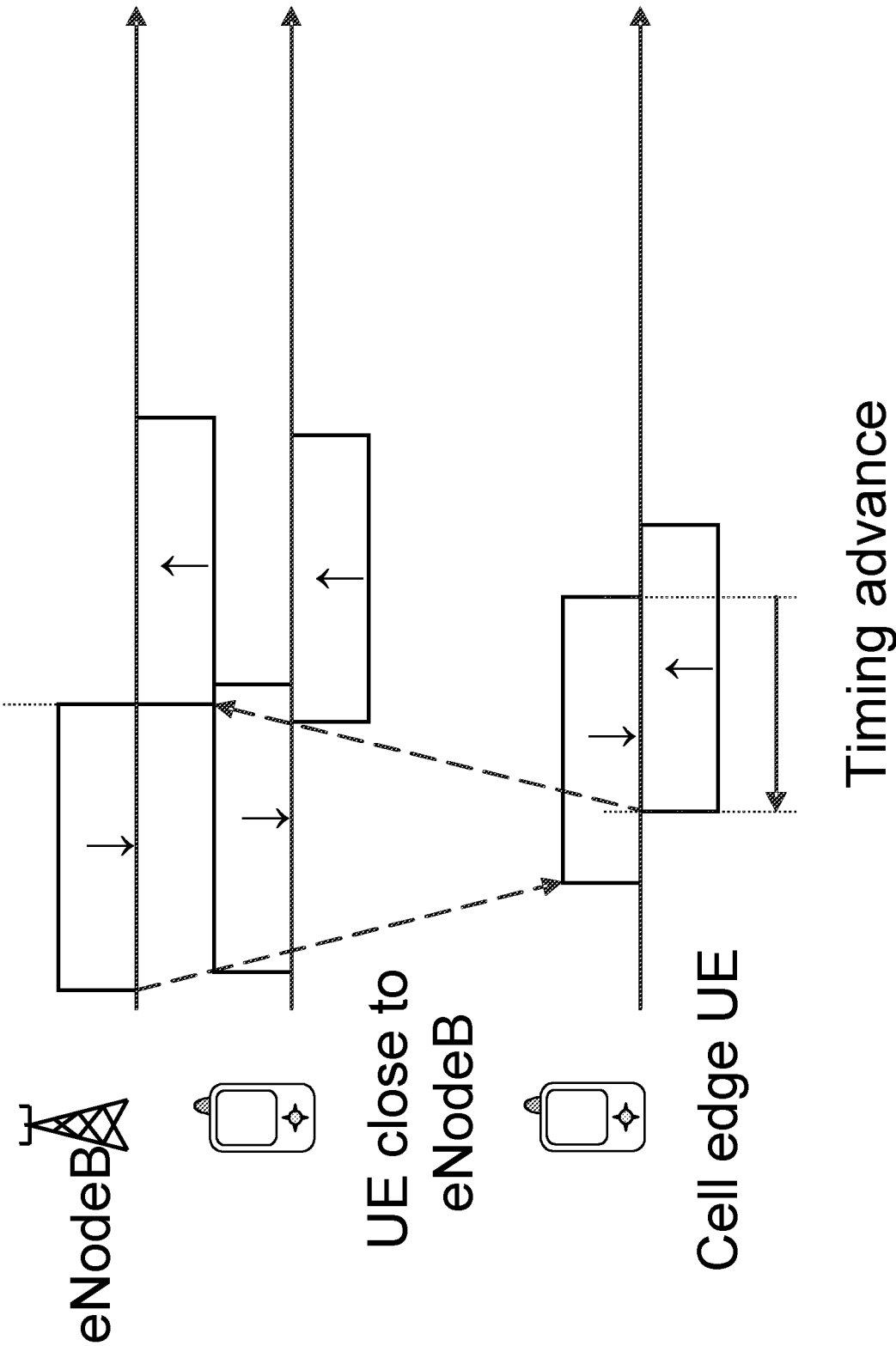


FIGURE 5

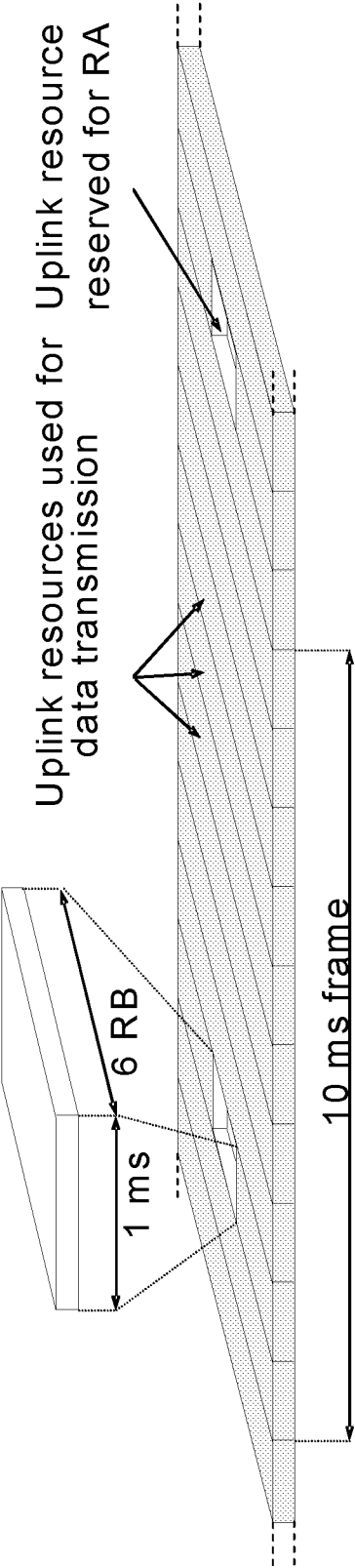


FIGURE 6

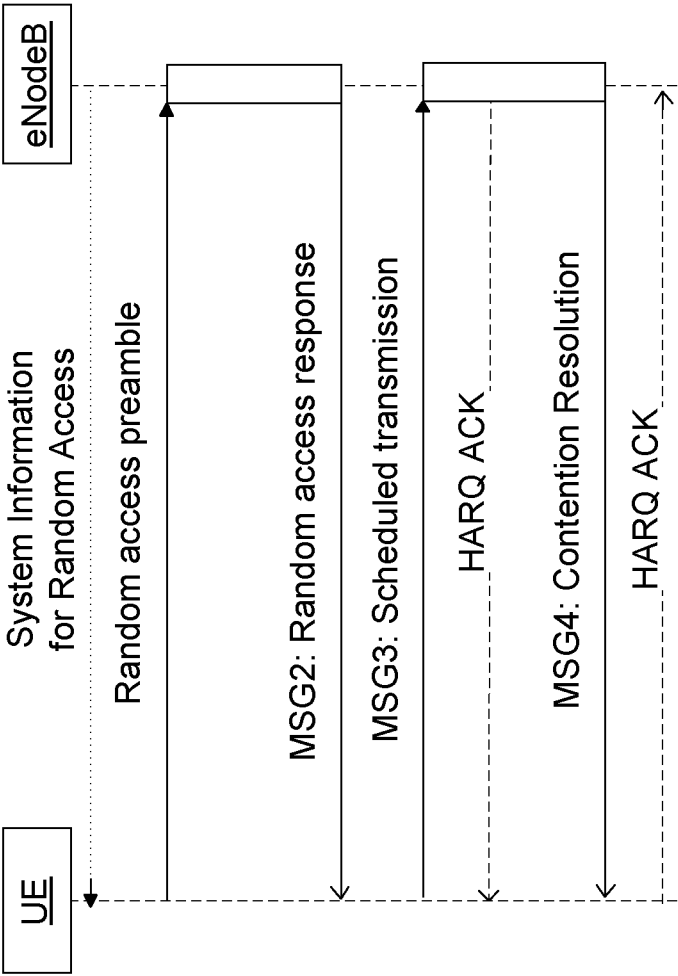


FIGURE 7

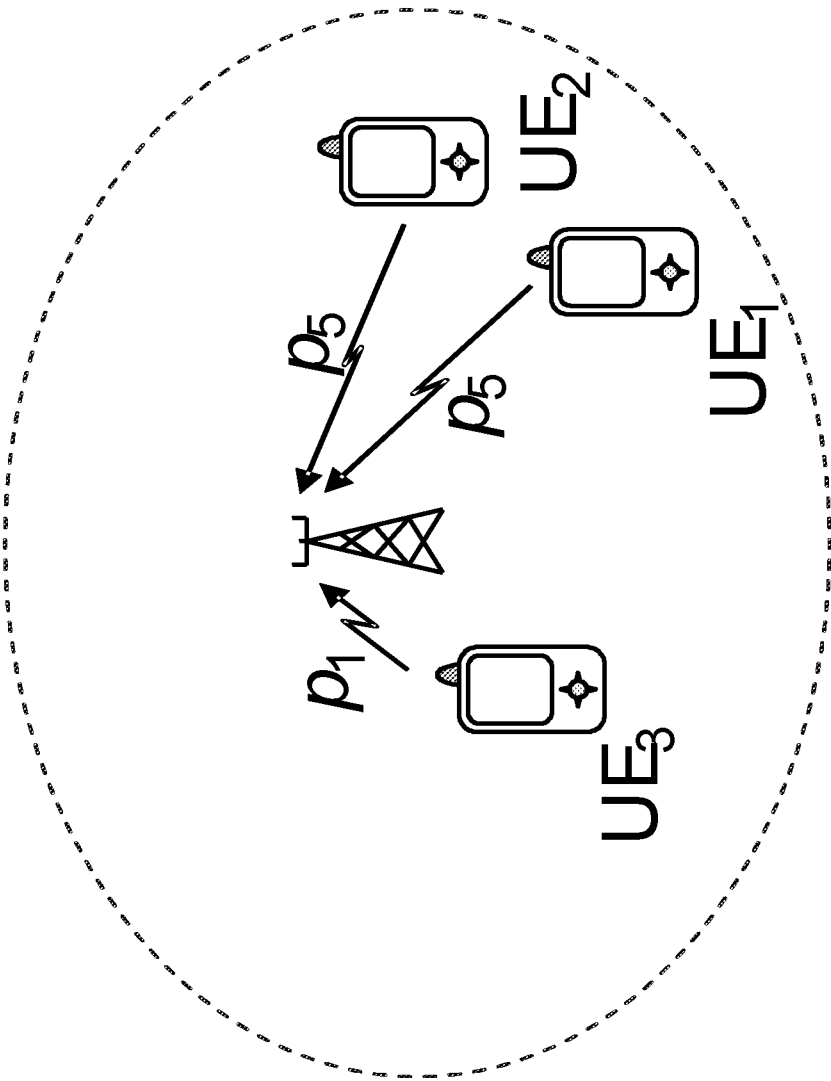


FIGURE 8

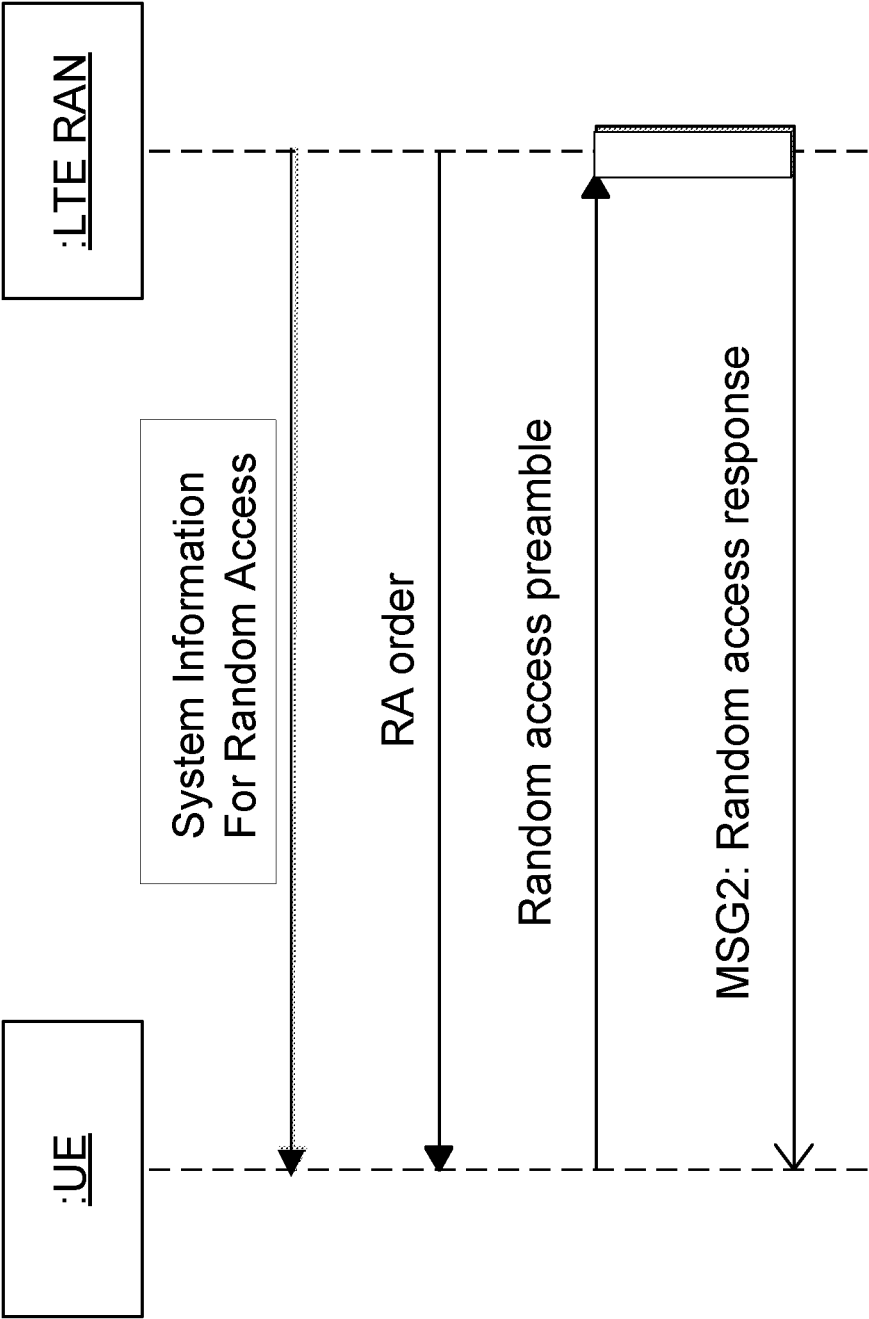


FIGURE 9

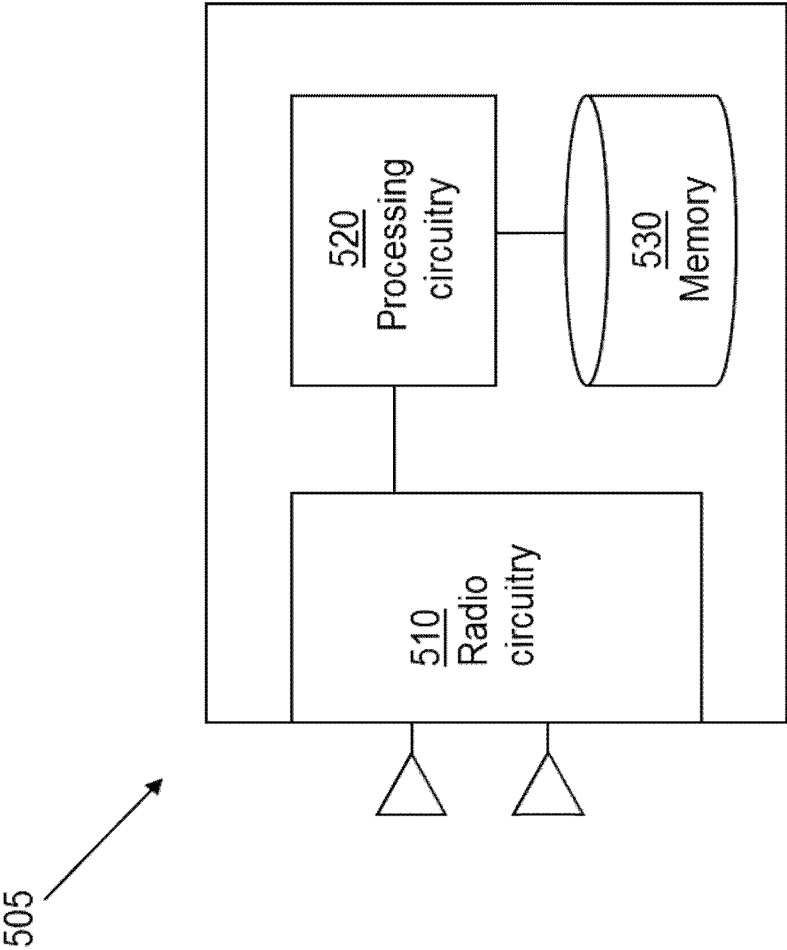


FIGURE 10

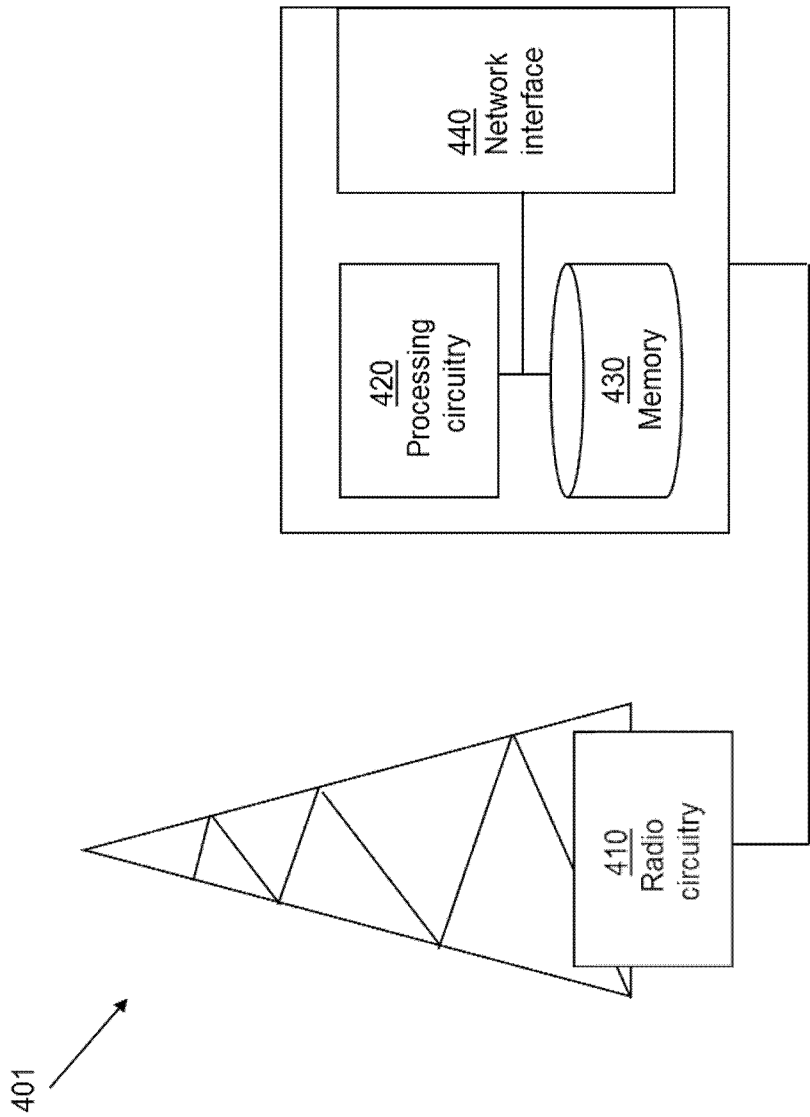


FIGURE 11

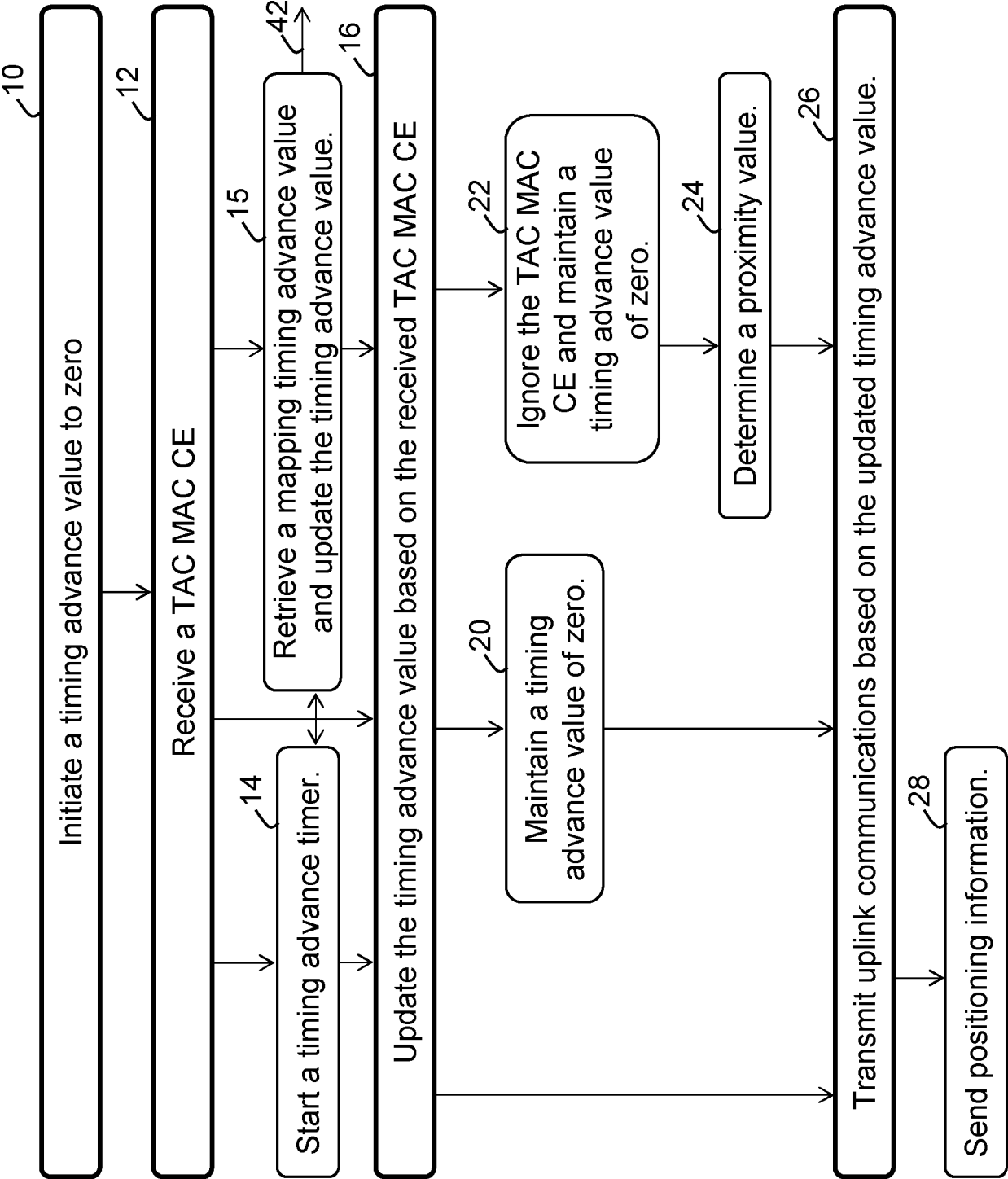


FIGURE 12

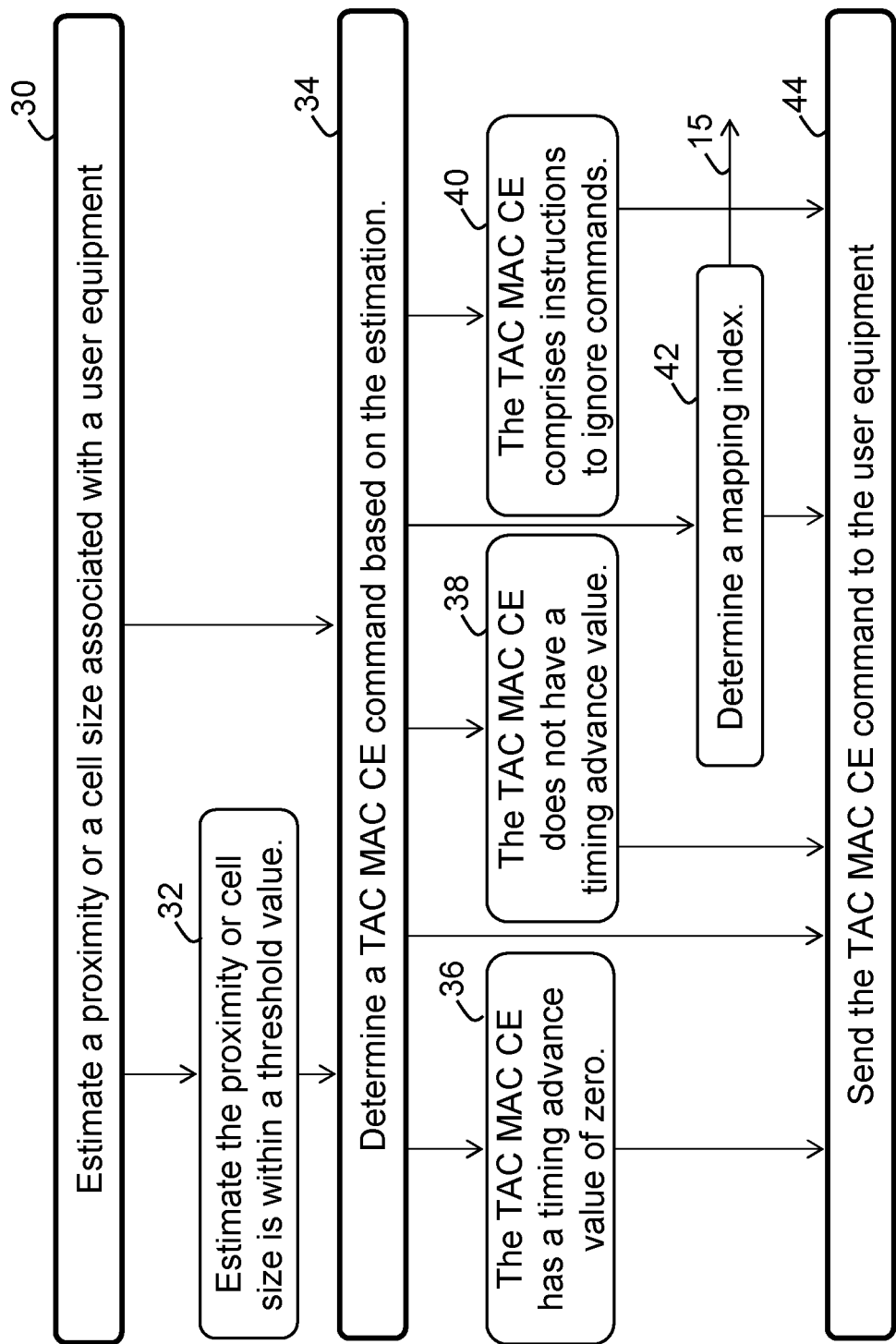


FIGURE 13